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LISTING STATEMENT No. 2021

LISTED JUNE 9th, 1959
5,000,000 shares of \$1.00 par value
Ticker abbreviation ORC
Dial ticker number 644
Post section 5.2

TORONTO STOCK EXCHANGE

LISTING STATEMENT

ORCHAN MINES LIMITED

Incorporated under the laws of the Province of Ontario by Letters Patent dated March 6, 1953 with
Supplementary Letters Patent dated July 30, 1957.

1. Address of the Company's Head Office and of any other offices:
Room 1403, 100 Adelaide Street West, Toronto, Ontario.

JUN 22 1959

OFFICE HELD	NAME	ADDRESS	OCCUPATION
President	James Patrick Dolan	7 Glen Rush Blvd., Toronto.	Prospector
Vice-President and Secretary-Treasurer	Robert Alexander Cranston	1 Glen Willow Place, Toronto	Barrister

NAME	ADDRESS	OCCUPATION
James Patrick Dolan	7 Glen Rush Blvd., Toronto.	Prospector
Robert Alexander Cranston	1 Glen Willow Place, Toronto.	Barrister
Eric Cradock	37 Old Yonge Street, Toronto.	Executive
Armand Dumas, M.P.	Malartic, Quebec.	Quebec Land Surveyor and Forestry Engineer
Cyril Hubert Windeler	247 Colborne Street East, Oakville, Ontario.	Secretary

4. Names and addresses of all transfer agents:
The Sterling Trusts Corporation, 372 Bay Street, Toronto, Ontario.

5. Particulars of any fee charged upon transfer other than customary government taxes:
50¢ per certificate.

6. Names and addresses of all registrars:
The Sterling Trusts Corporation, 372 Bay Street, Toronto, Ontario.

7. Amount of authorized capital: \$5,000,000.00.

8. Number of shares and par value: 5,000,000 shares of \$1.00 each.

9. Full details of all shares issued in payment for properties or for any other assets other than cash:

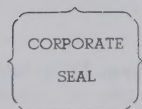
Date	Number of Shares	Brief description
(a) 1953.....	750,000	Mineral Claims Leo No. 1 to Leo No. 10 Lake Athabaska, Saskatchewan —aggregate consideration 750,000 shares.
(b) 1956.....	100,000	86 Mining Claims in New Brunswick which have been allowed to lapse— aggregate consideration 100,000 shares.
(c) 1957.....	200,000	All outstanding shares of Hochelaga Quebec Mines Limited (no personal liability)—aggregate consideration 200,000 shares and \$25,000.00 cash.
(d) 1958.....	200,000	Mining Claims A243096 - A243109 and A24311 - A243115 Galinee Township, County of Abitibi-East, Quebec—aggregate consideration 200,000 shares and \$15,000.00 cash.
Total.....	1,250,000	

10. Full details of all shares sold for cash.	Date Number of Shares Price per Share Amount realized by Company
	March, 1953..... 5 \$1.00 \$ 5.00 March, 1953..... 400,000 .25 100,000.00 March, 1953..... 400,000 .40 160,000.00 October, 1955..... 225,000 .20 45,000.00 August, 1958..... 400,000 .18 72,000.00 September, 1958..... 100,000 .25 25,000.00 September, 1958..... 100,000 .30 30,000.00 September, 1958..... 100,000 .35 35,000.00 May, 1957..... 200,000 .37 74,000.00 July, 1957..... 30,000 .40 12,000.00 February, 1959..... 100,000 .25 25,000.00 February, 1959..... 100,000 .30 30,000.00 February, 1959..... 100,000 .35 35,000.00 February, 1959..... 375,000 .75 281,250.00 February, 1959..... 375,000 .90 337,500.00 Total..... 3,005,005 \$1,261,755.00
11. Total number of shares issued.	4,255,005.
12. Number of shares now in treasury or otherwise unissued.	744,995.
13. Particulars of any issued shares held in trust for the Company or donated for treasury purposes.	None.
14. Date of last annual meeting.	June 27th, 1958.
15. Date of last report to shareholders.	April 11th, 1958.
16. Details of any treasury shares (or shares issued subject to payment or shares held for the benefit of the treasury) now under option or the subject of any underwriting or sales agreement. If none, this is to be stated.	None.
17. Details of any shares pooled, deposited in escrow, non-transferable or held under any syndicate agreement or control.	There are 925,000 shares held in escrow as follows: 475,000 shares, part of the stock issued in payment for properties as set out in Item 9(a) are held in escrow by The Sterling Trusts Corporation to be released only with the consent of the Ontario Securities Commission and of the Quebec Securities Commission; 90,000 shares, part of the stock issued in payment for properties as set out in Item 9(b) are held in escrow by The Sterling Trusts Corporation to be released only with the consent of the Canadian Stock Exchange and the Ontario Securities Commission and the Quebec Securities Commission; 180,000 shares, part of the stock issued in payment as set out in Item 9(c) and 180,000 shares, part of the stock issued in payment for properties as set out in Item 9(d) are held in escrow by the said Trust Company subject to release only with the consent of the Canadian Stock Exchange and the Quebec Securities Commission. (Note—The written consent of The Toronto Stock Exchange for the release of the escrowed shares has been required as a condition for listing.)
18. Details of any registration with or approval or authority for sale granted by or any filing with a Securities Commission or corresponding Government body.	Ontario Securities Commission—1953—March 27th. Quebec Securities Commission—1959—January 29th.
19. Has any application for registration with or approval or authority for sale by or any filing with a Securities Commission or corresponding Government body ever been refused, cancelled, suspended or revoked? If so, give particulars.	No.

20. Particulars of any bonds, debentures, notes, mortgages, charges, liens or hypothecations outstanding.	None.
21. Enumerate fully, giving claim or property numbers, approximate acreage, townships and mining camp or oil field:	(i) The Company is the holder of Mineral Claims Leo No. 1 to Leo No. 13 inclusive and 6 fractional claims totalling 644.33 acres in the Athabaska Mining District, Province of Saskatchewan. A lease has been obtained from the Saskatchewan Government of claims Leo No. 1 to Leo No. 10 inclusive. (ii) The Company is the holder of development licenses 35289, 35290, 35291 and 35292 covering Claims A243096 to A243100, A243101 to A243105, A243106 to A243109 and A243111 to A243115 respectively in the Township of Galinee in the Electoral District of Abitibi-East in the Province of Quebec. (iii) The Company is the holder of Mining Claims Cert. 129850 Claims 1 to 5, Cert. 129852 Claims 1 to 5, Cert. 129853 Claims 1 to 5, Cert. 129854 Claims 1 to 5, Cert. 129855 Claims 1 to 5, Cert. 129856 Claims 1 to 5, and Cert. 129857 Claims 1 to 5 in Subercase Township in the Province of Quebec. (iv) The Company is the holder of Mining Claims Cert. 142081, Claims 1 to 5, Cert. 142023, Claims 1 to 5, Cert. 142024, Claims 1 to 5, Cert. 142025, Claims 1 to 5, Cert. 142026, Claims 1 to 5, Cert. 142096, Claims 1 to 5, Cert. 144186, Claims 1 to 5, and Cert. 144187, Claims 1 to 5, in the Township of Fenelon in the Province of Quebec. (v) The Company pursuant to Agreement dated the 24th day of April, 1958, in consideration of it completing a boundary and geophysical survey on the Claims, acquired from Armand Dumas, Malartic, Quebec, an option, exercisable within two years from the said date, to purchase Mining Claims A250109 to A250125 inclusive and A250094 to A250108 inclusive in the Township of Isle Dieu in the Province of Quebec. In consideration of Iso Uranium Mines Limited of Room 1403, 100 Adelaide Street West, Toronto, assuming the Company's liability to complete the aforesaid surveys, the Company transferred to Iso Uranium Mines Limited a 50% interest in the said option. If the option is exercised then the said Armand Dumas will be entitled to 100,000 shares of Iso Uranium Mines Limited and 100,000 shares of this Company or the option may be exercised by Iso Uranium Mines Limited and this Company causing to be incorporated a new company to acquire the Claims and causing the new Company to issue to the said Armand Dumas one-half of all shares issued as consideration for the acquisition of the Mining Claims.
(a) Properties owned where titles vested in Company.	
(b) Properties leased.	
(c) Properties otherwise held.	
22. Full particulars of any royalties or other charges payable upon production from each individual property.	None, other than if Leo group of claims is brought into production then a royalty will be payable to the Saskatchewan Government.
23. Are any lawsuits pending against the Company or any of its properties, or are there any other circumstances which might affect the Company's position or title adversely? If so explain fully.	No.
24. Describe plant and equipment on property.	Three frame buildings on property described in Item 21(ii) hereof.
25. Describe development accomplished and planned.	As at April 30, 1959, 27,529 feet of diamond drilling had been done on the property described in Item 21(ii) hereof. The company proposes to sink a shaft to explore from underground workings the ore bodies indicated by diamond drilling on its property described in Item 21(ii) hereof and to continue diamond drilling on the company's mining claims.
26. Date and author of mining or petroleum engineer's or geologist's report filed with this application and available for inspection on request.	April 30, 1959—C. Philip Jenney. April 28, 1959—W. J. Dean.
27. Full particulars of production to date.	None.
28. Have any dividends been paid? If so, give date, per share rate, and amount paid in dollars on each distribution.	None.

29. Name and address of the solicitor or attorney whose certificate that the applicant is a valid and subsisting company and that the shares which have been allotted and issued were legally created and are fully paid and non-assessable has been filed with the Exchange.	Lang, Michener & Cranston, 50 King Street West, Toronto, Ontario.	
30. (a) Have any shares of the Company ever been listed on any other stock exchange? If so, give particulars.	Yes—Canadian Stock Exchange.	
(b) Is any application for listing the shares of the Company on any other stock exchange now pending or contemplated? If so, give particulars.	No.	
(c) Has the listing of any shares of the Company ever been refused or deferred on any stock exchange? If so, give particulars.	No.	
31. Particulars of the principal business in which each director has been engaged during the past five years, giving the length of time, position held and name of employing company or firm.	James Patrick Dolan	Prospector and President of Iso Uranium Mines Limited and Orchan Mines Limited.
	Robert Alexander Cranston	Barrister—Lang, Michener & Cranston, Toronto, Ontario.
	Cyril Hubert Windeler	Secretary, Noranda Mines Limited, Toronto, Ontario.
	Eric Cradock	Stock Broker, Cradock Securities Limited Toronto, Ontario, and since May 22nd, 1958 President, Cradock Holdings Limited.
	Armand Dumas	Quebec Land Surveyor and Forestry Engineer.

Dated at Toronto, Ontario, the 27th day of May, 1959.



ORCHAN MINES LIMITED
 "J. P. DOLAN," President.
 "R. A. CRANSTON," Secretary.

STATEMENT SHOWING NUMBER OF SHAREHOLDERS AS OF MAY 8th, 1959.

Number		Shares
56	Holders of 1— 100 shares.....	5,054
233	" " 101—1000 ".....	121,950
33	" " 1001—2000 ".....	56,100
17	" " 2001—3000 ".....	47,650
20	" " 3001—4000 ".....	47,450
8	" " 4001—5000 ".....	47,500
80	" " 5001—up ".....	3,929,301
447	Stockholders	Total Shares.....4,255,005

FINANCIAL STATEMENTS

ORCHAN MINES LIMITED BALANCE SHEET AS AT 15th MARCH, 1959

ASSETS

Cash on hand and in bank.....	\$106,187.40	
Bank deposits.....	350,000.00	
Note receivable—General Motors Acceptance Corporation Ltd.....	192,972.60	
Government of Canada Treasury bills.....	49,522.50	
Sundry deposits and amounts receivable.....	3,873.08	
Field advance expense accounts.....	4,315.72	
		\$ 706,871.30
Investment in and advances to:		
Hochelaga Quebec Mines Limited.....		157,780.41
Mining properties.....	\$131,000.00	
Buildings and equipment.....	15,581.64	
		146,581.64
Deferred exploration and development, including head office and administration expense.....		484,577.49
Incorporation and organization.....		6,130.33
		<u>\$1,501,941.17</u>

LIABILITIES

Accounts payable and accrued charges.....		\$ 53,186.17
CAPITAL STOCK:		
Authorized: 5,000,000 shares of \$1.00 par value each.		
Issued and fully paid:		
Original incorporators—5 shares.....	\$ 5.00	
For properties—1,050,000 shares.....	\$1,050,000.00	
Less discount.....	929,000.00	
		121,000.00
For shares of Hochelaga Quebec Mines Limited—200,000 shares.....	\$ 200,000.00	
Less discount.....	134,000.00	
		66,000.00
For cash—3,005,000 shares.....	\$3,005,000.00	
Less discount.....	1,743,250.00	
		1,261,750.00
		<u>\$1,448,755.00</u>
		<u>\$1,501,941.17</u>

NOTE: Shares of the capital stock of the company were issued during the period as follows:
1,050,000 shares for cash \$708,750.00.

Approved:

“J. P. DOLAN”, Director.

“R. A. CRANSTON”, Director.

AUDITORS' REPORT

We have examined the balance sheet of Orchan Mines Limited as at 15th March, 1959 and the statement of deferred exploration and development, including head office and administration expense, for the period 1st January, 1959 to 15th March, 1959. Our examination included a general review of the accounting procedures and such tests of accounting records and other supporting evidence as we considered necessary in the circumstances. We have received all the information and explanations we have required.

In our opinion, the above balance sheet and attached statement of deferred exploration and development, including head office and administration expense, present fairly the financial position of the company as at 15th March, 1959, and the results of its operations for the period ended on that date.

“CRAIG, NORMAN, FAIRLEY & WELSH”,
Chartered Accountants.

Toronto 7, Canada
6th April, 1959.

**STATEMENT OF DEFERRED EXPLORATION AND DEVELOPMENT,
INCLUDING HEAD OFFICE AND ADMINISTRATION EXPENSE
FOR THE PERIOD, 1st JANUARY, 1959 TO 15th MARCH, 1959**

EXPLORATION AND DEVELOPMENT:

Balance, 1st January, 1959.....	\$346,112.38	
Cote group, per schedule attached.....	73,624.29	
Fenelon group.....	6,256.54	
Kitchigama group.....	1,522.03	
Leo group.....	651.00	
Outside prospecting.....	606.32	
		<u>\$428,772.56</u>

HEAD OFFICE AND ADMINISTRATION:

Balance, 1st January, 1959.....	\$ 49,712.65	
Advertising.....	50.00	
Consulting fees.....	2,100.00	
Fees and licenses.....	217.00	
Legal, audit and accounting.....	1,500.00	
Office rent.....	501.00	
Office salaries.....	500.00	
Office and sundry expense.....	40.00	
Postage and stationery.....	58.02	
Registration fees and costs—Quebec Securities Commission.....	1,691.56	
Stock exchange fees.....	256.09	
Telephone and telegraph.....	114.01	
Transfer agents fees and expenses.....	171.60	
Unemployment insurance.....	13.00	
	<u>\$ 56,924.93</u>	
Less: Investment income.....	1,120.00	
		<u>55,804.93</u>
		<u><u>\$484,577.49</u></u>

**SCHEDULE OF EXPLORATION AND DEVELOPMENT—COTE GROUP
FOR THE PERIOD, 1st JANUARY, 1959 TO 15th MARCH, 1959**

Telephone and telegraph.....	\$ 285.85
Maps, plans and drafting supplies.....	211.82
Mining licenses and taxes.....	205.38
Line cutting.....	1,112.20
Geophysical surveys.....	2,937.94
Engineering.....	1,362.50
Consulting fees.....	3,725.00
Board.....	1,190.91
Travelling and food.....	877.07
Transportation.....	737.27
Camp maintenance.....	1,247.40
Road construction.....	4,000.00
Assays.....	1,288.49
Core grabbing.....	862.50
Diamond drilling.....	53,579.96
	<u><u>\$73,624.29</u></u>

ENGINEERS' REPORTS

(Note—Figures 1-15 referred to in the Report of C.P. Jenney, P. Eng., and the Attachments referred to in the Report of W.J. Dean, B.Sc., P. Eng., are not printed as part of this Listing Statement but are on file and open for inspection at the general office of the Exchange.)

Properties in Galinee, Isle-Dieu, Subercase and Fenelon Townships, Counties of Abitibi-East and Abitibi-West, Quebec

SUMMARY

The facts herewith presented cover three groups of mining claims owned outright by Orchan Mines Limited and one group, the Boucier claims in Isle-Dieu Township, which is under option to Orchan and Iso Uranium Mines Limited, on an equal basis. All the mining claims are located in northwestern Quebec.

One property, the Cote Group in Galinee Township, is being explored by an intensive drilling program which has located important orebodies. The other three claim groups are in preliminary stages of exploration and no drilling programs have been initiated on them. Therefore, conclusions and recommendations as well as factual data pertaining to each of these properties are presented in two sections into which this report is divided.

The properties are described in order as:

Part A	Cote Group	Galinee Twp.	Abitibi-East, Quebec.
Part B-1	Boucier Group	Isle-Dieu Twp.	Abitibi-East, Quebec.
Part B-2	Kitchigama Group	Subercase Twp.	Abitibi-East, Quebec.
Part B-3	Fenelon Group	Fenelon Twp.	Abitibi-West, Quebec.

COTE GROUP, GALINEE TOWNSHIP

SUMMARY AND CONCLUSIONS

Exploration diamond drilling of this property commenced on September 28, 1959, and has been carried on continuously. Fifty-four holes have been drilled or are still drilling for a total of 27,529 feet, to April 30, 1959. Both vertical and inclined holes on a drilling grid with 100 foot spacing have been used to determine the position and grade of the ore blocks. Ten of the fifty-four holes have been put down southeast of the main ore area, on the same drill pattern, to explore for additional orebodies. Drilling is continuing with three machines in operation.

I estimate that drilling to April 30, 1959, on the north and south ore-zones has indicated 870,000 tons averaging 13.37% zinc, 1.71% copper, 0.015 ounces gold, and 1.43 ounces silver. With dilution of 10% included this would give 960,000 tons averaging 12.25% zinc, 1.58% copper, 0.014 ounces gold, and 1.31 ounces silver.

The next step in the development program will be shaft-sinking with exploitation and further exploration of the extensions of these orebodies from underground workings. I recommend that such a program be initiated as soon as possible.

Drilling now in progress some 1300 feet east of the above mentioned orebodies is encountering similar structure, alteration and geologic conditions to that characteristic of the ore-bearing areas to the west. If additional ore is discovered in this area, further underground exploration and development will be required.

Progress of open-pit studies and developments being carried on at Mattagami Lake Mines will be followed closely to determine whether such a development program might be applicable to the Orchan orebodies.

In addition, I consider that depth possibilities for discovery of further ore in the main ore zone area are extremely encouraging. The deepest hole to date, in this part of the property, penetrated to 800 feet, while only four holes reached below 600 feet. A number of shallow holes encountered alteration and low grade mineralization (similar to that surrounding the main orebodies) at depths between 500 and 600 feet. Therefore, exploration of the underlying rock area is imperative.

The possibility of a duplication of ore-making conditions on parallel structures in the western claims of the group will also require investigation by diamond drilling in the near future.

LOCATION AND ACCESS

The property is in northwestern Galinee Township adjoining the claims of Mattagami Lake Mines, Limited on the south. The base camp, in the eastern part of the ground, is approximately two miles southeast of Watson Lake, an aircraft landing base 95 miles north of Senneterre, Quebec.

Access is by chartered aircraft from Senneterre or from Amos, Quebec and by bush road from Watson Lake. A winter airstrip, located within a few hundred feet of the base camp, is available for landing with ski-equipped aircraft under favorable snow conditions. A winter road from Amos, Quebec—a distance of 120 miles—provides access for freight and heavy equipment during the winter months. It is anticipated that this road will be improved to an all weather road in the future.

PROPERTY

The group comprises nineteen mining claims covering a surveyed total of 625.903 acres:

Certificates	Claim Numbers
122167—1 to 5	A-243096—243100
122168—1 to 5	A-243101—243105
122169—1 to 4	A-243106—243109
122170—1 to 5	A-243111—243115

A surveyed plan of the mining claims is attached hereto as Figure 1 of this report.

An application is being made to the Quebec Government for a patented concession covering all claims of this property.

SURFACE PLANT AND EQUIPMENT

The present camp consists of three frame buildings, one 18' x 28' which serves as an office and staff quarters, and two 18' x 28' buildings for drill core storage. The drill contractor maintains a cookery and quarters for the crews of the three drills now in operation.

HISTORY OF THE PROPERTY

The ground was first staked in March 1957 soon after the acquisition, by the Mattagami Syndicate, of the Mattagami Lake Mines property to the north. No prospecting or development work is known to have been done on the ground prior to that time.

GEOPHYSICAL SURVEYS

During 1958 lines were cut on a north south grid at 400 foot intervals over the whole property and both magnetometer and vertical loop electromagnetic surveys were carried out. A number of interesting magnetic anomalies were located, of which the most striking was one with 2,400 gamma relief located in the northeast part of claim 122169-3 (see Figure 2.). The electromagnetic survey located only two anomalies, both in the vicinity of this magnetic high.

Subsequently a second grid, with lines at 400 foot intervals, was cut with the baseline on a bearing of N 63 W over the eastern four claims. A second electromagnetic survey with vertical loop equipment operating at 400, 1000 and 5000 cycles covered this portion of the ground and located numerous conductors, in addition to confirming the two anomalies previously mentioned. The results of this survey (shown on Figure 3.) greatly enlarged the exploration possibilities and led directly to the drilling of the discovery hole.

A subsequent induced polarization survey over this same grid also added valuable geophysical guidance.

Further surveys of the western part of the property on grids cut with the same northwest bearing provided other electromagnetic targets for investigation by drilling.

GEOLOGY

No outcrops have been found on the property and geologic information is derived from diamond drilling. A few outcrops and extensive drilling on neighbouring properties have added, and are continuing to add, to our geologic knowledge of the general area. Consequently, it is possible at this time to present the Orchan-Cote geology in a setting related to the geology of the immediate area.

ROCK TYPES:

The most widespread rock of the area is a series of **andesite** flows and pillow lavas, with lesser thicknesses of dacitic and more acid flows accompanied by narrow flow top bands and tuffs, frequently carrying minor amounts of detrital material. These rocks vary in color from light gray or light gray green to dark gray and black and are porphyritic, amygdaloidal and spherulitic in places. Under the microscope the typical lava is found to have medium grained light colored masses in a microcrystalline groundmass. The light colored masses are largely anhedral plagioclase with some clinozoisite-epidote and white mica while the groundmass is a crystallo-blastic aggregate of hornblende, chlorite, clinozoisite, albite, quartz, carbonate, titanite and leucoxene.

The volcanic flows are intruded by irregular masses, dikes and sills of varying types and compositions, and all of these rocks are Pre-Cambrian in age. The most important intrusive type (by volume of occurrence) is a **peridotite-gabbro** which occurs in large masses, perhaps sills and plugs of intermediate size, and also as narrow sills and dikes. In this related series of basic to near-basic rocks the composition varies and may include such varieties as anorthosite, gabbro and peridotite. It is possible that some members of the family may be as acidic as diorite. For purposes of general description these rocks are grouped together as the peridotite-gabbro suite.

The typical peridotite-gabbro is an olivine-pyroxene-plagioclase rock with olivine in various stages of alteration to talc, tremolite and serpentine. The pyroxene alters to serpentine, chlorite and tremolite—and the plagioclase to clinozoisite. Some brown hornblende and phlogopite are present, and accessories frequently include magnetite, pyrrhotite, pyrite and chalcopyrite.

Dikes of **rhyolite porphyry** with variations to **quartz feldspar porphyry** and **feldspar porphyry** are common in the area. Frequently these have subhedral phenocrysts of albite (plus or minus rounded quartz eyes) in a very fine grained groundmass of alkali-feldspar, quartz, chlorite and muscovite.

Narrow and discontinuous **lamprophyre** dikes of both hornblende (camptonite) and biotite (kersanite) types have been encountered in drilling on the Orchan and neighboring properties. These dikes are post-mineral in age.

Typical **diabase** dikes which are dark gray green to black and composed of plagioclase, augite and magnetite (sometimes with olivine) with true diabasic structure have been encountered in drilling—occasionally in fairly thick dike or sill form. The relationship of these dikes to mineralization is not yet established.

On some neighboring properties drilling has encountered sections of more acid intrusives which may be related to **quartz monzonites** or **granites**.

STRUCTURE:

Close drilling in the Mattagami Area over the past two years has indicated that the key to the geologic structure is provided by two or more horizons of tuffite—a volcanic ash with the addition of certain detrital sedimentary material. Three horizons of such material have been found in one section on the Mattagami Lake Mines property. On the Orchan property, drilling in the northern section of the eastern claims has shown the presence of two of these horizons. These tuffites, plus a determined sequence of pillowed and massive andesitic lavas above and below these rocks, show that the northern ore section on Orchan is controlled by a rather wide fold or dome which plunges west-northwest. A similar structure 2,000 feet to the northwest controls the Mattagami Lake Mines No. 2 orebody and a more tightly folded anticlinal structure 1,000 feet northwest of No. 2 controls their No. 1 orebody. It is possible that all three ore zones—Mattagami Lake Mines Nos. 1 and 2 and Orchan may be located on the same structure. All three have steeper and more extensive west limbs and all three plunge in the same general direction. However, it is possible that the Orchan orebody is located on the crest of a second major anticlinal structure parallel to and west of Mattagami Lake No. 1 while Mattagami Lake No. 2 could be on either structure.

Recent drilling on line 13 East at Orchan has located similar mineralized tuffite to that of the horizon markers to the northwest and it is probable that the Orchan-North Zone structure, or another parallel to it to the west, extends through this part of the property.

FAULTS:

At least one, and probably two or more, major fault or shear zones trend roughly northwest through the eastern claims of the property. One of these probably cuts through the fold structure described above at its northern extremity and it is possible that a parallel structure to the south forms a locus for emplacement of one or more of the northern ore zones.

ALTERATIONS:

In the area of the ore zones both silicification and chloritization are extremely intense and widespread. Since the ores are hydrothermally emplaced replacement deposits, the importance of these alteration areas cannot be over-emphasized in the search for additional orebodies.

Drilling to date indicates that the main alteration zone extends from line 400 West, at least to line 1300 East.

ORE MINERALS:

In the attached sections the ore zones are usually comprised of massive sulphides but may consist of andesitic lavas containing 50% or more sulphides of ore grade. These sulphides in order of decreasing abundance are: pyrite, pyrrhotite, sphalerite and chalcopyrite with some occurrences of the oxide, magnetite. Detailed microscopic work is in progress but prior to determination of the exact mineralization sequence it appears that the order of deposition may be: 1. silica, 2. chlorite, 3. talc, 4. quartz in stringers, 5. magnetite, 6. pyrite, 7. pyrrhotite, 8. sphalerite, 9. chalcopyrite, 10. quartz. Resurgence of mineralization is indicated by the presence of at least two (and possibly three) ages of sphalerite, with the type of lower iron content coming in later.

ORE RESERVES

In estimating the ore indicated by diamond drilling on the Orchan property, ore blocks were outlined on each of the grid sections from and including section 100 East to section 300 West. Blocks were taken as shown on the attached section drawings, Figures 4, 5, 6, 7 and 8, as extending for one half the distance to the next adjacent drill hole, with slight modifications as required by the known geology.

Block areas were measured by planimeter, and lateral extent was taken as 50 feet (one half the distance to the adjacent section). The tonnage factor was 9 cubic feet.

Dilution was assumed to be 10% and an average of 27 samples—usually taken at ten foot intervals—above and/or below the ore intersections in the drill holes was determined as: Au 0.003 oz.; Ag 0.13 oz.; Cu 0.26%; Zn 1.07%.

Ore reserves were found to be:

Tonnage	Grade			
	Gold oz.	Silver oz.	Copper %	Zinc %
871,156	0.015	1.43	1.71	13.37
87,116 (Dilution)	0.003	0.13	0.26	1.07
958,272	0.014	1.31	1.58	12.25
Total Metal	Gold oz.	Silver oz.	Copper Tons	Zinc Tons
	13,416	1,255,336	15,141	117,388

Due to the almost vertical dip of some of the orebodies, the preferred plan of blocking out the ore by a series of equally spaced vertical holes had to be modified, as some holes—notably No. 42—ran continuously down the orebody while adjacent vertical holes encountered much shorter ore sections or weak mineralization. Although holes such as 42 give more information on the grade of the ore, since they sample a greater length, inclined holes were found to give a clearer picture of the attitude, shape and position of the orebodies.

A plan showing the location of all holes drilled to date is attached hereto as Figure 9 of this report.

NOTE: Planimeter scalings of ore areas on the accompanying Figures 4 to 8, inclusive, were made on sections at a scale of 1 inch to 30 feet. Therefore, the accompanying figures are illustrative only.

METALLURGICAL TESTS:

No metallurgical work on the Orchan ores has been inaugurated to date. Split core samples, and rejects of all samples assayed to date, are being retained on file pending inauguration of metallurgical testing. Intensive studies will start as soon as a small tonnage of ore is available from underground, but it is recommended that preliminary work on the cores start as soon as possible.

EXPLORATION POSSIBILITIES:

To date drilling on the northern Orchan area has indicated the presence of two ore zones whose occurrence seems to be controlled by a plunging dome or anticline broken by one or more shear zones, and modified by minor fold structures. This major structure is similar to that of the two orebodies to the northwest on the Mattagami Lake Mines property. Continuation of the drilling to the west is designed to trace these two ore-zones to depth and test the crest of the major structure for additional ore.

In nine holes drilled to the 500 foot horizon under the south ore zone important lengths of low grade mineralization have been encountered. It is possible that this mineralization may indicate the presence of additional massive sulphide orebodies at depth in this area. Future deep drilling, to 1,500 or 2,000 foot levels, will test this possibility.

The recently discovered anticlinal structure, with the mineralized tuffite horizon, on line 1300 East (together with associated magnetic and electromagnetic anomalies) will require thorough drill testing to determine whether an ore body is present in this area.

Both magnetic and electromagnetic anomalies found on the western claims of the Orchan group will also require drilling exploration.

PART B.

1. BOUCIER GROUP, ISLE-DIEU TOWNSHIP

SUMMARY AND CONCLUSIONS

Geological and geophysical work to date has established the presence of favorable greenstone volcanics and tuffs as well as magnetic anomalies on this property, and interesting ore discoveries have been made on adjoining properties to the east and west. Further geophysical and geological exploration, including a program of diamond drilling, if warranted, will be carried forward during 1959.

PROPERTY, LOCATION AND ACCESS

The property lies on the east side of the Bell River in southeastern Isle-Dieu Township approximately 100 airline miles by chartered aircraft north of Senneterre, Quebec.

The 32 claims comprise:

Certificates	Claim Numbers
129887—1 to 5	A-250094—098
129888—1 to 5	A-250099—103
129889—1 to 5	A-250104—108
129890—1 to 3, & 5	A-250109—112
129891—1 to 5	A-250113—117
129892—1 to 5	A-250118—122
129893—1 to 3	A-250123—125

Figure 10 of this report shows the surveyed claims, plus the line cutting grid for the geophysical surveys.

HISTORY AND DEVELOPMENT

The claims were staked in 1957 and no records are available showing any prior staking or development work on this ground.

During 1958 reconnaissance electromagnetic and magnetic surveys indicated the presence of some magnetic anomalies. Further detailed surveys will be carried out in 1959.

GEOLOGY

An area of greenstone, bounded on the south by anorthosite, has been found to trend slightly north of west across the property. To the east, diamond drilling on a neighboring property has located a zone of copper mineralization in an andesite-tuff series. Recent drilling on a property to the northwest has intersected copper-zinc values in similar rocks.

Although outcrops are scarce, further geologic work, pursued by diamond drilling if warranted by geophysical results, will be directed to tracing these favorable mineralized volcanic rock zones east and west through the property.

PART B.

2. KITCHIGAMA GROUP, SUBERCASE TOWNSHIP

SUMMARY AND CONCLUSIONS

Reconnaissance geologic work plus standard electromagnetic and magnetic surveys have located two interesting geophysical anomalies in a favorable geologic setting. Diamond drilling will be required to test these exploration possibilities.

PROPERTY, LOCATION AND ACCESS

The claims are in southeastern Subercase Township on the southwest shore of Grasset Lake about 100 miles north of Amos, Quebec. Access is by chartered aircraft from Amos or Senneterre, Quebec.

The 35 claim group comprises:

Certificates	Claim Numbers
129850—1 to 5	A-249044—048
129852—1 to 5	A-249039—043
129853—1 to 5	A-249034—038
129854—1 to 5	A-249029—033
129855—1 to 5	A-249024—028
129856—1 to 5	A-249019—023
129857—1 to 5	A-249014—018

A survey plan of the mining claims is attached hereto as Figure 11 of this report.

HISTORY AND DEVELOPMENT

At least a portion of the property was staked a number of years ago to cover a showing of sulphides on the south shore of Grasset Lake. Some diamond drilling was done on this discovery but results of this work are not available.

Geophysical surveys carried out during 1958 and 1959 have indicated the presence of two magnetic and electromagnetic anomalies in the central part of the property. These may, or may not be, related along strike with the original discovery. They are shown on Figures 12. and 13. respectively, of this report.

GEOLOGY

Prior work has established the presence of andesitic lavas on the property and also the presence of the sulphides, pyrite, pyrrhotite and chalcopyrite.

Diamond drilling will be required to establish the relationship, if any, between such sulphide occurrences and the geophysical anomalies.

PART B.

3. FENELON GROUP, FENELON TOWNSHIP

SUMMARY AND CONCLUSIONS

Magnetic and electromagnetic surveys of this property, conducted during the winter of 1958-59, have not indicated any drilling targets offering encouragement for future work. The property will be held pending exploration developments on neighboring claims.

PROPERTY, LOCATION AND ACCESS

The property is in southeastern Fenelon Township about 100 miles north of Amos, Quebec.

Access is by chartered aircraft from Amos or from Senneterre, Quebec to a lake in the center of the property, which provides a convenient landing base.

Forty mining claims, covering approximately 1600 acres, comprise the group. These are:

Certificates	Claim Numbers
142023—1 to 5	A-273543—547
142024—1 to 5	A-273548—552
142025—1 to 5	A-273558—562
142026—1 to 5	A-273553—557
142081—1 to 5	A-273538—542
142096—1 to 5	A-273533—537
144186—1 to 5	A-286525—529
144187—1 to 5	A-286530—534

HISTORY AND DEVELOPMENT

The ground was staked during July of 1958 and, as far as is known, had no prior history of prospecting or acquisition. Development to date has been confined to magnetic and electromagnetic ground surveys, results of which are shown on Figures 14 and 15 of this report. No rock outcrops have been found by prospecting.

GEOLOGY

Nothing is known of the geology of the property but it is inferred, from geophysical information only, that the underlying bedrock consists of volcanic rocks.

Since geophysical results were not encouraging, no further exploration work has been recommended.

Oakville, Ontario,
April 30, 1959

"C. P. JENNEY"

CERTIFICATE

- I, Charles Philip Jenney, of the Town of Oakville, in the Province of Ontario, do hereby certify as follows:
1. That I am a Consulting Geologist registered as a member in good standing of the Association of Professional Engineers of the Province of Ontario.
 2. That the following is a true statement of my education, experience, and affiliations:
Columbia University, New York
1926-30, B.A. 1930
1930-33, M.A. 1933, Ph.D. 1936 (Geology)
Princeton University, 1933-34
1934-36, Geologist, Consolidated Oil Corp., New York.
1936-43, Mine & Exploration Geologist, McIntyre Porcupine Mines, Schumacher, Ontario.
1943-49, Mgr. Canadian Exploration, The American Metal Co. of Canada, Ltd., Toronto, Canada.
1949-55, Ass't. Mgr. Exploration Dept., The American Metal Co., Ltd., New York.
1956—, Consulting Geologist, Oakville, Ontario.

Societies:

Geological Society of America
Society of Economic Geologists
American Institute of Mining & Metallurgical Engineers
Canadian Institute of Mining & Metallurgical Engineers
Geological Association of Canada.

Experience:

Directed major exploration projects for The American Metal Company in Yukon; Coppermine River Area, N.W.T.; Great Slave Lake Lead-Zinc Area, N.W.T.; Labrador; New Brunswick; Quebec; Maine; Arizona; plus exploration and mine examination work in all provinces of Canada and most states of the U.S.A., and in the West Indies.

3. That I have no direct or indirect interest in any of the shares or securities of Orchan Mines, Ltd.
4. That the information set forth in this report was obtained by me directly, or by engineers and geologists working under my direction and supervision. All data obtained by others have been checked by me to my satisfaction and, consequently, I assume full responsibility for all facts presented in this report.

"C. P. JENNEY",

Oakville, Ontario.

P.Eng. Ontario.

REPORT ON LEO PROPERTY OF ORCHAN MINES LIMITED, LAKE ATHABASKA, SASKATCHEWAN

The President and Directors,
ORCHAN MINES LIMITED,
Room 1403—100 Adelaide Street West,
Toronto 1, Ontario.

28th April, 1959

Gentlemen:

INTRODUCTION

This report on your Leo Group of mining claims located on Crackingstone Point, Lake Athabaska, Saskatchewan, is based on:

1. My studies of reports and plans made in the past by consulting engineers and geologists employed by Orchan Uranium Mines Limited, (the predecessor of Orchan Mines Limited) to supervise and report on the development work as it was being carried out in 1953.
2. My studies of various geological reports and maps prepared by the Geological Survey of Canada covering the area in which this property is located.
3. Observations I have made in the field in the area in which this property is located in July 1927, March and April 1937, and July 1955.

SUMMARY AND CONCLUSIONS

1. The work done to date has disclosed numerous radioactive occurrences, but none have been of sufficient size to be of any economic interest.
2. This property is located in the general Beaverlodge uranium producing area, and its east boundary is located about two miles west of the main ore body of the profitable uranium producer, Gunnar Mines Limited. Consequently, this property can be considered as being a good "location bet".
3. The geological structure is considered as being favourable for uranium occurrences.

RECOMMENDATIONS

It is recommended that:

1. No work be done at the present time.
2. The claims be retained.

PROPERTY

This property consists of:

1. Ten surveyed mineral claims Leo 1 to Leo 10 inclusive, and fractions totalling 644.33 acres. These are held under lease from the Saskatchewan Government until March 1, 1978.
2. Three unleased mineral claims Leo 11, 12 and 13, totalling approximately 150 acres, which are in good standing until April 12, 1961.

LOCATION AND ACCESS

This property is located on Crackingstone Point in the Beaverlodge uranium producing area approximately two miles west of the Gunnar Mine's ore body, south shore of Black Bay, Lake Athabaska, Saskatchewan.

(Latitude 59°23' North, longitude 108°57' West)

It is surrounded on three sides by Lake Athabaska and has a good harbour location.

It is reached by boat from Waterways, a distance of about 250 miles, and by aeroplane from Uranium City, a distance of 20 miles. Uranium City is on a Canadian Pacific Airlines scheduled route from Edmonton, Alberta.

HISTORY

The mineral claims comprising this property were staked by Gunnar Berg in August 1952 shortly after the discovery of the ore body on the nearby Gunnar Mines Ltd. property. On March 6, 1953, Orchan Uranium Mines Limited was incorporated and took over these holdings.

In 1957, the name Orchan Uranium Mines Limited was changed to Orchan Mines Limited.

PRODUCTION

There has not been any production from this property.

From their nearby property, Gunnar Mines Ltd. reported in their Annual Report for 1958 that they milled 711,298 tons of ore grading 3.76 lbs. U_3O_8 per ton, from which the sale of uranium concentrates yielded \$23,809,839. The net profit for 1958 after all write-off was \$11,311,000 or \$3.25 per share.

DEVELOPMENT

Development work to date has consisted of prospecting, radiation surveys, geological mapping, and nineteen holes totalling 8,282 feet of diamond drilling, which was done in 1953.

GEOLOGY

The rocks in the area are of Precambrian age. The rocks on the property consist of interbanded Tazin Series gneisses which are thought to be of sedimentary origin, and which have been intruded by younger granite and its derivatives. Remnants of younger quartzites overlay the gneisses on a small portion of the property. The gneisses are similar to those occurring on the nearby Gunnar property in which their ore body occurs. They have a general northeasterly strike and dip steeply to the northward. Considerable faulting has taken place. Two major faults known as the St. Mary's Channel Fault and the Black Bay Fault are thought to intersect on this property. Several subsidiary shear zones also occur on the property, some of which are stained red with hematite.

Uranium minerals occur in fracture-filled zones in wrinkles in the paragneisses.

ORE

Numerous radioactive occurrences were found but none are of sufficient size to be of any economic interest.

PLANT AND EQUIPMENT

There is none.

APPENDICES

ATTACHMENTS:

- No. 1 Key Map showing location of the property, scale 1"—60 miles.
- No. 2 Preliminary Plan of Survey of Leo Group, scale 1"—500 feet, dated January 1954.
- No. 3 Plan showing geology and location of diamond drill holes, scale 1"—200 feet, dated September 1953.

REFERENCES:

1. Twenty-fifth Annual Report, Gunnar Mines Limited for 1958.
2. Goldfields-Martin Lake Map Area, Sask., Geol. Survey of Canada.
3. Geological Map 363A—Tazin Lake Sheet, Geol. Survey of Canada, scale 1"—4 miles.

Toronto, Ontario,
April 28, 1959.

"W. J. DEAN", B.Sc., P.Eng.

CERTIFICATE

I, W. J. DEAN, of the City of Toronto, in the County of York, Province of Ontario, hereby certify that:

1. I am a Mining Geologist and Engineer residing at 56 Chaplin Crescent, Toronto 7, Ontario.
2. I am a graduate of the University of Alberta, Edmonton, Alberta, with the degree of Bachelor of Science in Mining Geology, Faculty of Applied Science, 1928, and have been practising my profession of Mining Geologist for thirty-one years.
3. I am a Registered Professional Engineer of the Province of Ontario in the Mining Division.
4. I have no interest directly or indirectly in the Leo Property, nor in Orchan Mines Limited, nor do I expect to receive any interest directly or indirectly in the property, nor in Orchan Mines Limited.
5. My report dated April 28, 1959, is based on my studies of reports, plans and maps made by engineers and geologists looking after the work on the property and by the Geological Survey of Canada, and on observations I have made in the area in which this property is located.

Dated at Toronto, in the County of York, Province of Ontario, this 28th day of April, nineteen hundred and fifty-nine.

"W. J. DEAN", B.Sc., P.Eng.